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Publication date:
2015

Document Version
Peer reviewed version

Link back to DTU Orbit

Citation (APA):
Holdt, S. L., Silva Marinho, G., & Angelidaki, I. (2015). *Seaweed potentials – evaluation of year-round biomass composition of commercial cultivated sugarkelp- results from project KOMBI*. Abstract from 5th Nordic Seaweed Conference, Grenaa, Denmark.

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Nordic Seaweed Conference 2015, Oct 7-8

Kystvejen's Hotel and Conference Center, Kystvej 26, 8500 Grenaa, Denmark

Seaweed potentials – evaluation of year-round biomass composition of commercial cultivated sugarkelp- results from project KOMBI:

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ABSTRACT

In this study, the year-round protein, amino acid, fatty acid, pigments, mineral and vitamin content and profiles were considered to evaluate the nutritional value and harvest time of the *Saccharina latissima* biomass for optimized value and application.

Sugarkelp was cultivated both in close proximity to a blue mussel and fish farm (IMTA) and in a reference site, both outside Horsens fjord in Denmark. Sugarkelp biomass was measured by harvesting sporophytes (deployed in February 2013) from 1m rope droppers (n=3) at 2 m depth in 2013-2014. Biomass was weighed, followed by freeze drying, homogenizing and chemical characterization by various methods for the specific analyses of biomass composition.

Protein content varied throughout the experimental period with the highest values recorded in November (10.8%) and the lowest values recorded in May 2013 (1.3 %). The lipid concentration varied from 0.62-0.88% DW in July to 3.33-3.35% DW in November ($P<0.05$). Polyunsaturated fatty acids (PUFA's) made up more than half of the fatty acids with a maximum in July (52.3-54.0% FAME), including the most appreciated health beneficial EPA and DHA. Mineral content are discussed in relation to legislations, and a few trace metals such as Cd, Pb, Iodine may be problematic in some seasons. The pigment profile did not change during the year, however the concentration did, and with fucoxanthin as the most interesting.

Generally the year-round variations were due season, and no difference between the two locations (reference and IMTA).